

**Anthropometric measurements** of weight and height/length should be done on all newly arriving refugees. Accurate measurements of weight, height/length, and age are required for the identification of malnutrition to be made. Criteria for obtaining data of good quality include using the right equipment to collect the data and employing standard measuring techniques.<sup>64</sup> For example, children should be weighed in their underwear without shoes; children under the age of 2 years should lie on a suitable board to have their length measured, and children over 2 should stand up to have their height determined.

To interpret anthropometric data among children less than 5 years of age, the child's height and weight should be compared with reference curves of height-for-age, weight-for-age, and weight-for-height by using the [WHO \(World Health Organization\) growth standards](#) or [2000 CDC Growth charts](#). Most clinicians use the CDC growth chart cut points for children > 2 years of age in the U.S.; less than 5th percentile for "under-nutrition", 85th-95th percentile for "overweight" and > 95th percentile as "obese". For children <24 months of age the [American Academy of Pediatrics and CDC now recommend using the WHO growth standard](#). A body mass index (BMI) should be calculated for all refugees older than 2 years. Three different classification systems can be used to distinguish "normal" from "not normal" growth in childhood: z-scores, percentiles, and percent of median. **Although percentiles are typically used in the United States\*, WHO recommends the use of the z-score** (a z-score of 1 represents 1 standard deviation from the reference median). **Malnutrition is defined as a z-score of less than -2** for weight-for-height (e.g., wasting), height-for-age (e.g., stunting), or weight-for-age (e.g., underweight). A cutoff point of a **z-score of -3 is used to identify severely malnourished children.** Refugees may present with severe malnutrition (SAM) or more commonly in a state of chronic undernutrition and/or overweight/obesity (i.e., stunting, or weight/height <-2 or overweight/obesity or BMI/age >2).

Exhibit #	Name (optional)	Sex	Date of birth	Date of measurement	Height (centimeters)	Weight (kilograms)	BMI	BMI %ile	Z-SCORE
68X	DR HANS	F	8/3/2003	2/7/2008	100.3	13.2	13.1	0.9	-2.37
			54M	418d	0.01cm	6.46g/d			
68T	DR HANS	F	8/3/2003	3/31/2009	106.7	15.9	14.0	14.4	-1.02
			67.9M	1095d	0.01cm	3.74g/d		-0.5	
68S	CLF DR HANS	F	8/3/2003	3/30/2012	121.9	20	13.5	3.4	-1.79
			103.9M	11d	1.4cm	54.54g/d		0	
88B	CLF CCHMC NUTR	F	8/3/2003	4/10/2012	123.5	20.6	13.5	3.7	-1.79
			104.2M	676d	0.01cm	5.9g/d		-0.2	
88B	CLF CCHMC URGENT	F	8/3/2003	2/15/2014	135.9	24.6	13.3	0.8	-2.39
			126.5M	12d	0.06cm	41.6g/d		-0.4	
68E	CLF DR FARBER	F	8/3/2003	2/27/2014	136.7	24.1	12.9	0.2	-2.79
			126.9M	230d	0.02cm	18.7g/d		1.1	
88B	CLF CCHMC OB/GYN	F	8/3/2003	10/15/2014	142.5	28.4	14.0	2.2	-1.99
			134.4M	124d	0.022cm	9.67g/d		-0.1	
74A	CLF DR FARBER	F	8/3/2003	2/16/2015	146.1	29.6	13.9	1.3	-2.18
			138.5M	11d	0.022cm	36.3g/d		0.2	
82F	CLF DR FARBER	F	8/3/2003	2/27/2015	144.1	29.2	14.1	1.9	-2.03
			138.8M	3d	0.022cm	133.3g/d		-0.5	
88B	CLF CCHMC NUTR	F	8/3/2003	3/2/2015	145.6	28.8	13.6	0.7	-2.44
			138.9M	25d	0.022cm	80g/d		0.8	
88B	CLF CCHMC OB/GYN	F	8/3/2003	3/27/2015	145.6	30.8	14.5	4.1	-1.76
			139.8M	10d	0.022cm	50g/d		0.4	
88B	CLF CCHMC NUTR	F	8/3/2003	4/6/2015	145.6	31.3	14.8	5.7	-1.56
			140.1M	3d	0.03cm	166g/d		-0.4	
89F	CLF CCHMC GI	F	8/3/2003	4/9/2015	145.7	30.5	14.4	3.1	-1.83
			140.1M	85d	0.004cm	24.7g/d		0.9	
91A	CLF CVS CLINIC	F	8/3/2003	7/3/2015	146.1	32.6	15.3	9.2	-1.31
			143.0M	16d	0.06cm	156g/d			
91E	CLF CVS CLINIC	F	8/3/2003	7/19/2015	148	35.1	16.0	18.2	w/z -0.88
			143.5M	12d	0.06cm	50g/d			
91i	CLF CVS CLINIC	F	8/3/2003	7/31/2015	148	34.5	15.8	14.3	w/z -1.0
			143.9M	10d	0.06cm	30g/d			
93L	CLF CCHMC NUTR	F	8/3/2003	8/10/2015	148.5	34.8	15.8	14.5	-1.04
			144.2M	21d	0.0cm	9.5g/d		-0.1	
94B	CLF CCHMC GI	F	8/3/2003	8/31/2015	148.4	34.6	15.7	13.3	-1.12
			144.9M	120d	0.01cm	0.83g/d		-0.3	
91L	CLF CVS CLINIC	F	8/3/2003	12/29/2015	149.9	34.7	15.4	8.6	-1.39
			148.9M						
MS.LUEGERS TESTIFIED AT 5:19:18									
Normal WT = 5-8gms per day over a year									
Normal HT = 0.01 - 0.02cm per day over a year/Total = 5- 8cm a year									